

Mission Incident  
Santa Paula, CA  
Preliminary Summary of Air Monitoring Results  
December 29, 2014

Prepared by  
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## Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vacuum truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 29, 2014 07:00 to December 30, 2014 07:00.

## Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine ( $\text{Cl}_2$ ), hydrogen sulfide ( $\text{H}_2\text{S}$ ), hydrochloric acid ( $\text{HCl}$ ), percent of the Lower Explosive Limit (LEL), ammonia ( $\text{NH}_3$ ), oxygen ( $\text{O}_2$ ), peroxides, particulate matter (10 micron particles,  $\text{PM}_{10}$ ), sulfur dioxide ( $\text{SO}_2$ ), sulfuric acid ( $\text{H}_2\text{SO}_4$ ), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. Additional units (Unit 09 and Unit 10) were deployed in the cabs of excavators supporting solidification operations in the Exclusion Zone. AreaRAEs were equipped with sensors to detect  $\text{Cl}_2$ , VOCs, LEL,  $\text{H}_2\text{S}$ , and  $\text{SO}_2$ . Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE units 01, 02, 03, and 04 and data-logged to monitor  $\text{PM}_{10}$ . Additional monitors were data-logged in the cabs of excavators supporting solidification operations in the exclusion zone. Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary<sup>1</sup>  
December 29, 2014 07:00 – December 30, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range <sup>2</sup>
Community	O <sub>2</sub>	MR+ / MR Pro	54	54	20.9	20.9 - 20.9 %
	VOC	MR+ / MR Pro	54	0	NA	<0.1 ppm
Work Area	Cl <sub>2</sub>	Gastec 8La	3	0	NA	<0.05 ppm
		MR+ / MR Pro	30	0	NA	<0.1 ppm
	H <sub>2</sub> S	Gastec 4LL	1	0	NA	<0.1 ppm
		MR+ / MR Pro	19	0	NA	<0.1 ppm
	HCl	Gastec 14L	2	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	18	0	NA	<1 %
	NH <sub>3</sub>	Gastec 3L	4	0	NA	<0.2 ppm
	O <sub>2</sub>	MR+ / MR Pro	26	26	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	7	0	NA	<0.1 ppm
	PM <sub>10</sub>	AM510/Dusttrak	5	5	0.03	0.017 - 0.065 mg/m <sup>3</sup>
	SO <sub>2</sub>	Gastec 5Lb	1	0	NA	<0.1 ppm
		MR+ / MR Pro	31	0	NA	<0.1 ppm
	H <sub>2</sub> SO <sub>4</sub>	Gastec 35	5	0	NA	<0.2 mg/m <sup>3</sup>
	VOC	MR+ / MR Pro	33	0	NA	<0.1 ppm

<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary<sup>1</sup>  
December 29, 2014 07:00 – December 30, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range <sup>2</sup>
Unit 01	H <sub>2</sub> S	4304	0	NA	< 1 ppm
	LEL	4304	0	NA	< 1 %
	SO <sub>2</sub>	4304	0	NA	< 0.1 ppm
	VOC	4304	1	0.1 ppm	0.1 - 0.1 ppm
Unit 02	H <sub>2</sub> S	3978	46	0.5 ppm	0.4 - 0.8 ppm
	LEL	4226	0	NA	< 1 %
	SO <sub>2</sub>	4226	0	NA	< 0.1 ppm
	VOC	4226	865	0.1 ppm	0.1 - 0.3 ppm
Unit 03	H <sub>2</sub> S	4227	312	0.1 ppm	0.1 - 0.3 ppm
	LEL	4227	0	NA	< 1 %
	SO <sub>2</sub>	4227	0	NA	< 0.1 ppm
	VOC	4227	0	NA	< 0.1 ppm
Unit 04	H <sub>2</sub> S	4180	1	0.1 ppm	0.1 - 0.1 ppm
	LEL	4180	0	NA	< 1 %
	SO <sub>2</sub>	4180	0	NA	< 0.1 ppm
	VOC	4180	0	NA	< 0.1 ppm
Unit 09	Cl <sub>2</sub>	839	0	NA	< 0.1 ppm
	SO <sub>2</sub>	839	0	NA	< 0.1 ppm
	VOC	839	769	0.4 ppm	0.1 - 0.9 ppm
Unit 10	Cl <sub>2</sub>	5100	254	0.1 ppm	0.1 - 0.3 ppm
	LEL	3	0	NA	< 1 %
	SO <sub>2</sub>	5100	0	NA	< 0.1 ppm
	VOC	5100	961	0.4 ppm	0.1 - 1.9 ppm

<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM<sub>10</sub> Monitoring Summary<sup>1</sup>  
December 29, 2014 07:00 – December 30, 2014 07:00

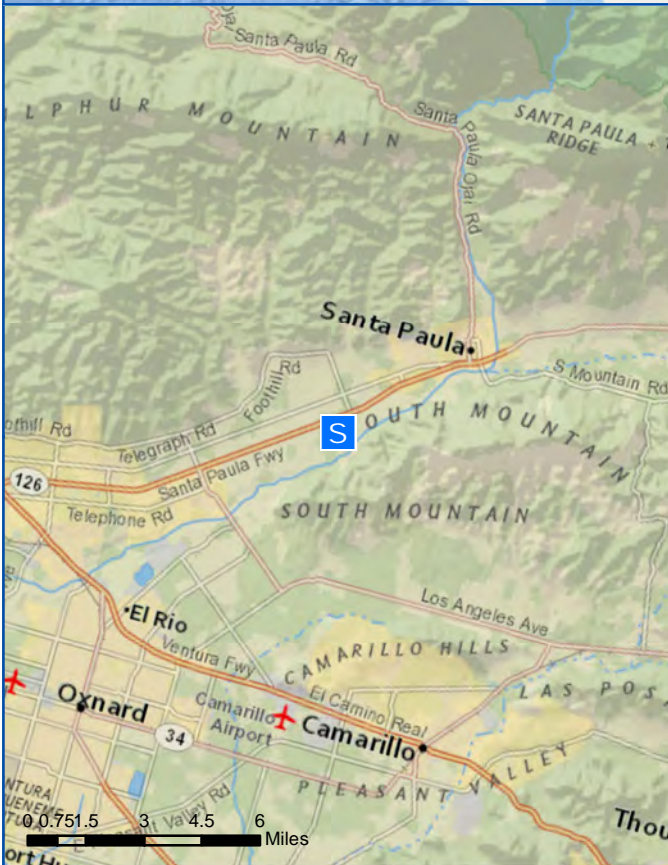
Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
<b>10601072</b>	AR01	3043	3043	0.023	0.009 - 0.086 mg/m <sup>3</sup>
<b>10503020</b>	AR02	3223	3223	0.04	0.014 - 1.667 mg/m <sup>3</sup>
<b>10704075</b>	AR03	30967	30967	0.024	0.008 - 2.454 mg/m <sup>3</sup>
<b>10704074</b>	AR04	2652	2652	0.211	0.017 - 0.893 mg/m <sup>3</sup>
<b>10704070</b>	AR09 - Excavator 210G	146	146	0.036	0.023 - 0.115 mg/m <sup>3</sup>
<b>10901027</b>	AR10 - Excavator 200D	523	523	0.007	0.001 - 0.13 mg/m <sup>3</sup>


<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

# Appendix A

## Incident Maps:

### Real-time Air Monitoring Locations and Incident Site



**Legend**  
 Site Location

0 50 100  
Feet

0 250 500 1,000  
Feet



## Legend

- FRT Location
- Site Location







## Legend

### Monitoring Location

- Non-detect (< 0.05 ppm)
- S Incident Site



## Legend

### Monitoring Location

- Non-detect (< 1 %)
- S Incident Site



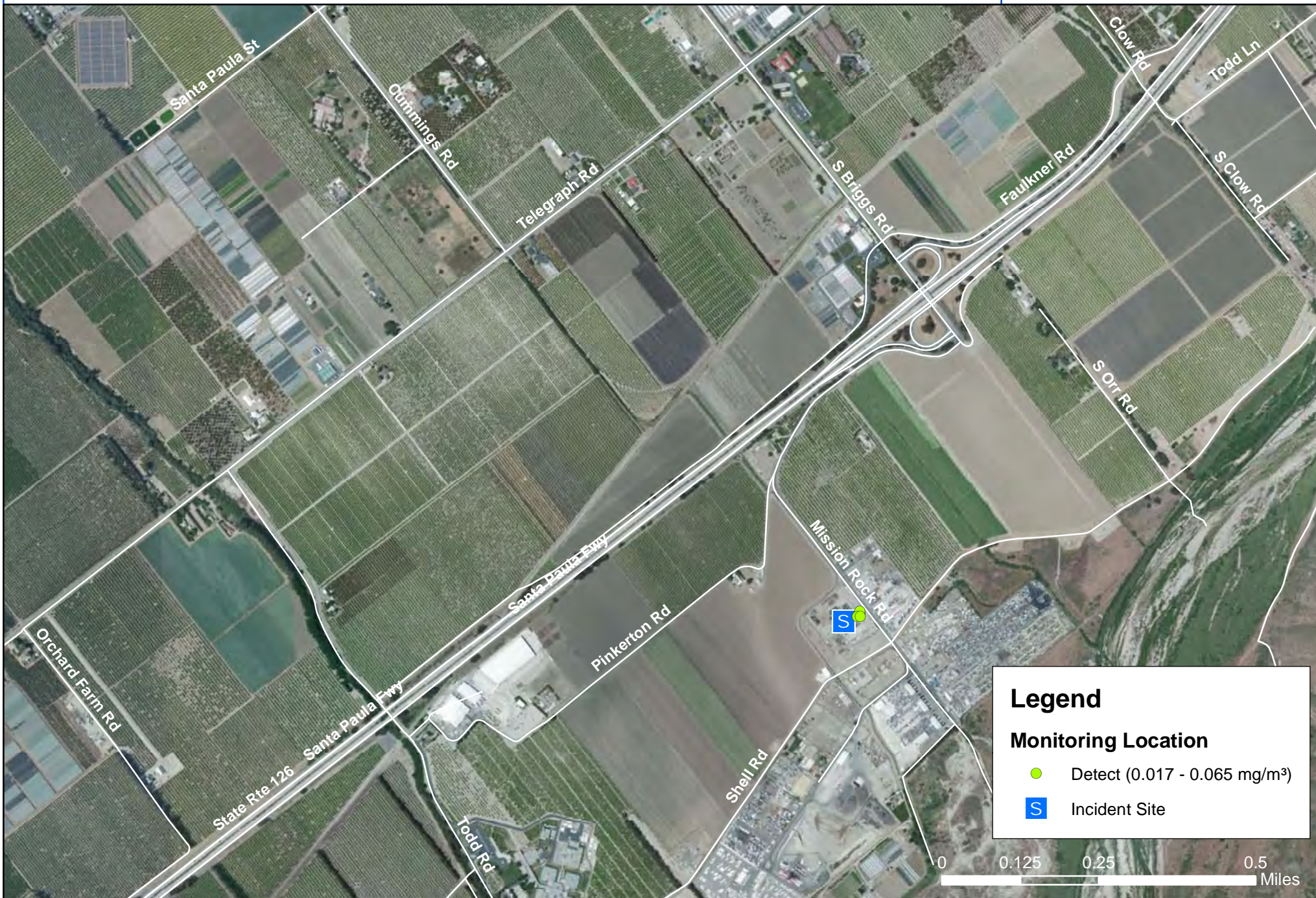


## Legend

### Monitoring Location

- Detect (20.9 %)
- S Incident Site









## Legend

### Monitoring Location

- Non-detect (< 0.2 mg/m<sup>3</sup>)
- S Incident Site

0 0.125 0.25 0.5 Miles

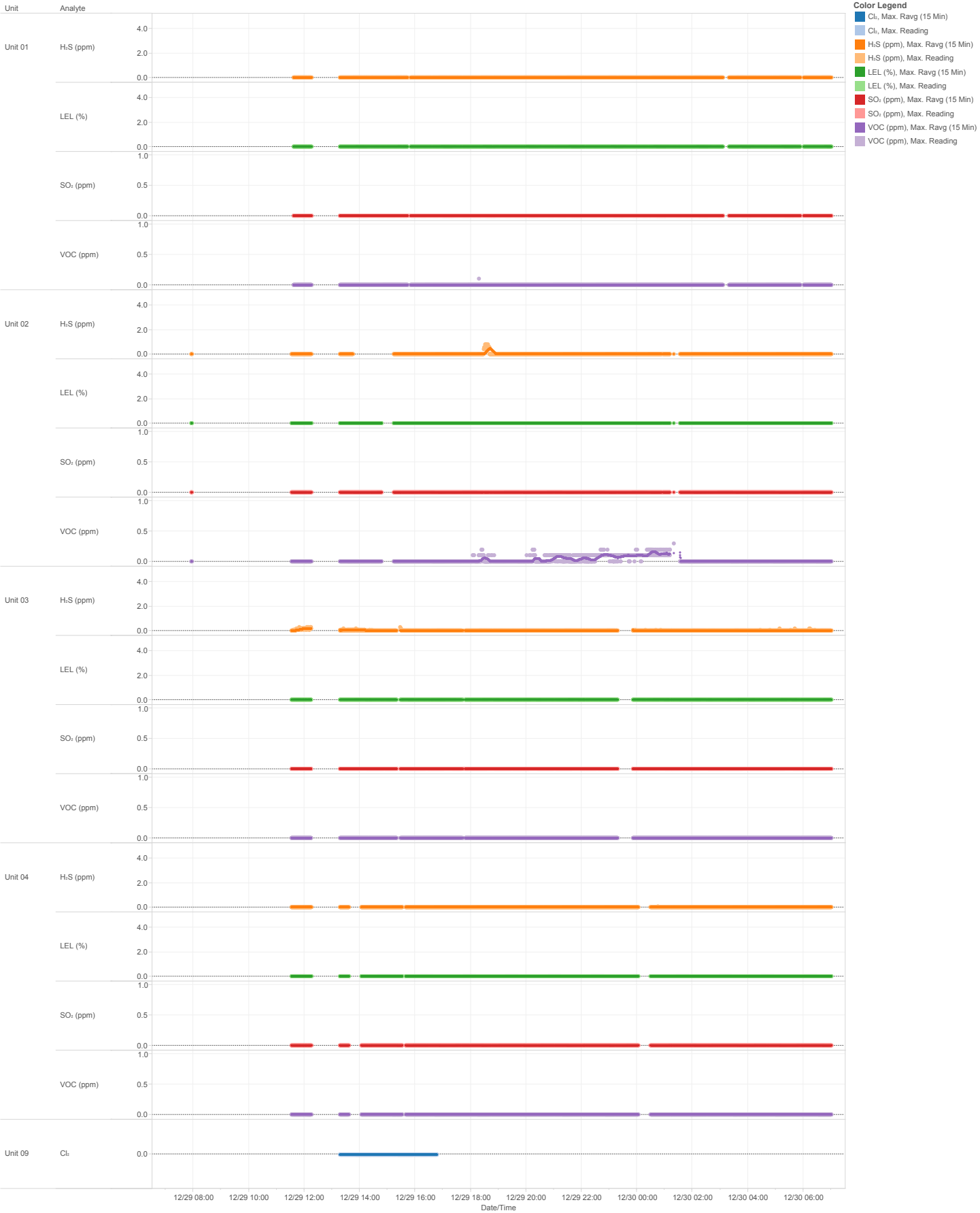


# Appendix B:

## AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

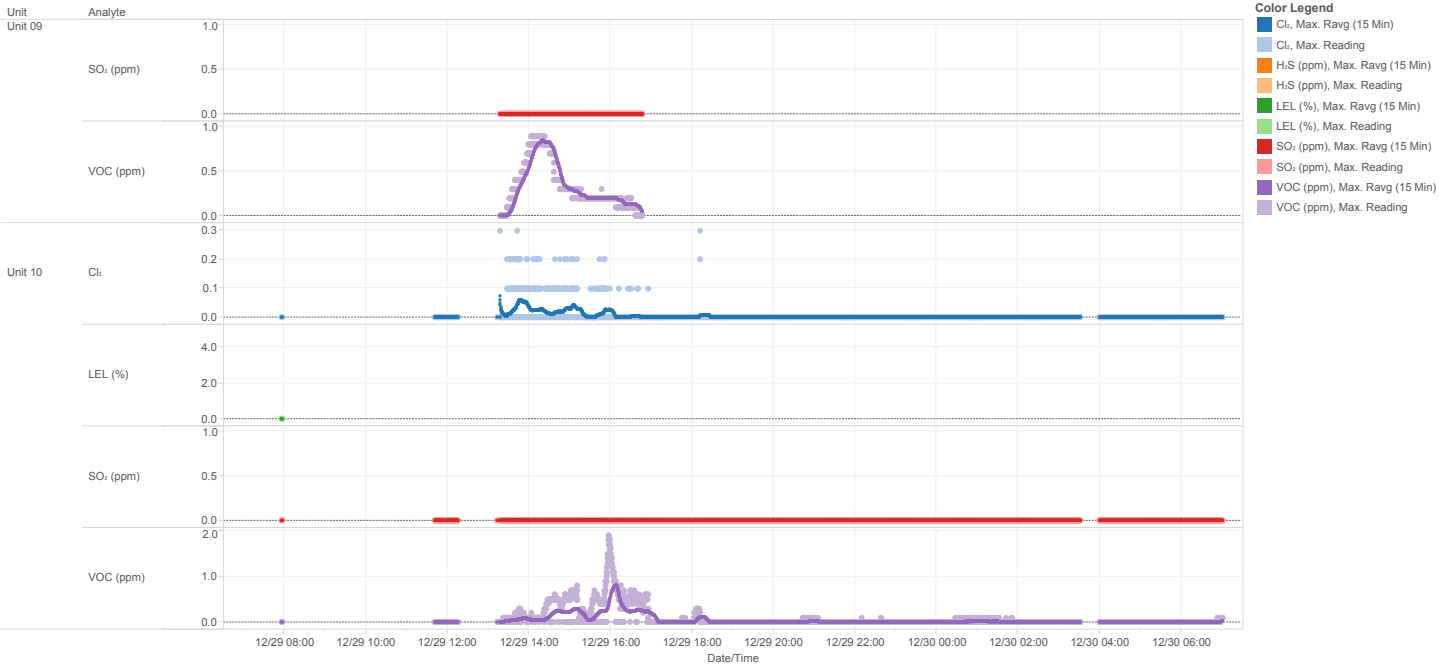


Patriot Environmental  
AreaRAE Trend Graphs  
12/29/2014 07:00 - 12/30/2014 07:00



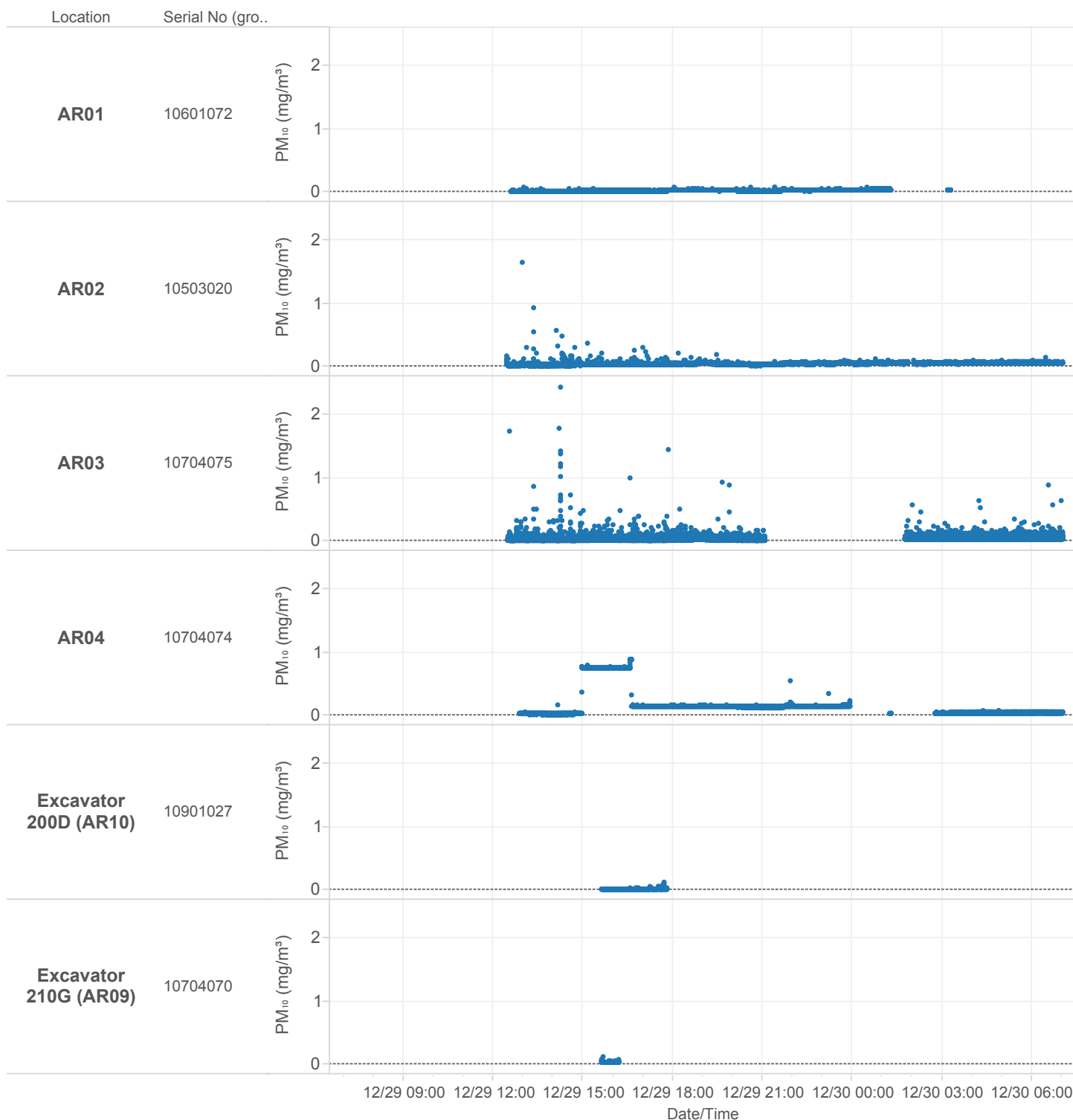
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format  
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental  
AreaRAE Trend Graphs  
12/29/2014 07:00 - 12/30/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.  
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental  
MISSION INCIDENT  
Datalogged AM510 (PM<sub>10</sub>) Summary  
12/29/2014 07:00 - 12/30/2014 07:00



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